

**IN THE CLAIMS:**

**Please amend the Claims of this application so as to read as follows:**

1. (Currently Amended) An optical disk reproducing apparatus for irradiating a surface of an optical disk with an optical beam and for reproducing information from recorded on an said surface of said optical disk having information recorded by the formation of a string of a plurality of pits each having one of at least two different depths in said surface of said optical disk, by irradiation of an optical beam, said apparatus comprising:
  - a photoreceptor element for detecting a quantity of reflected light of said optical beam reflected from said optical disk;
  - a pit depth detecting unit for detecting a depth of each said pit formed on said optical disk, based on the said quantity of reflected light said optical beam detected by said photoreceptor element;
  - a servo signal generating unit, for generating a tracking servo signal allowing whereby said optical beam may be caused to track said pit string, by detecting according to a detected deviation between said optical beam and said pit string, based on the said quantity of reflected light said optical beam detected by said photoreceptor element; and
  - an output control unit for controlling an output of the tracking servo signal generated by said servo signal generating unit, based on the result of the said detection by said pit depth detecting unit.

2. (Currently Amended) The optical disk reproducing apparatus according to claim 1, wherein

said output control unit ~~supplies~~ controls the output of said servo signal generating unit such that a the tracking servo signal generated is output by said servo signal generating unit for tracking by causing said optical beam, to track said pit string when a pit having such a depth that is to be reproduced is being tracked, and said output tracking servo signal also is stored and later output for causing said optical beam to track said pit string holds and supplies for tracking by said optical beam the tracking servo signal generated at the time of tracking of said pit having the depth to be reproduced, when a pit of a different depth is being tracked, based on the result of detection by said pit depth detecting unit.

3. (Currently Amended) The optical disk reproducing apparatus according to claim 1, wherein

said pit depth detecting unit detects a depth of each pit, based on a difference in the quantity of reflected light said optical beam reflected from the said pit string along a tangential direction.

4. (Currently Amended) The optical disk reproducing apparatus according to claim 3, wherein

said pit depth detecting unit includes

a first detecting unit for generating a first signal representing ~~the quantity of reflected light~~ a quantity of said optical beam reflected from said pit string,

a second detecting unit for generating a second signal indicative of ~~the~~ a difference of the quantity of reflected light in the quantity of said optical beam reflected from said pit string along the tangential direction, and

a third detecting unit for generating a third signal indicative of the depth of each pit, based on said first and second signals.

5. (Currently Amended) The optical disk reproducing apparatus according to claim 4, wherein

~~the said~~ third detecting unit includes

a first comparing circuit for comparing said second signal with a first reference value,

a second comparing circuit for comparing said second signal with a second reference value, and

a holding circuit for holding results of comparison by said first and second comparing circuits, at a time ~~point~~ of change of said first signal.

6. (Currently Amended) The optical disk reproducing apparatus according to claim 1, wherein  
said servo signal generating unit generates said tracking servo signal, by detecting a phase ~~difference~~  
differences in the quantity successive quantities of  
reflected light said reflected optical beam detected by said photoreceptor element.
7. (Currently Amended) The optical disk reproducing apparatus according to claim 1, wherein  
said servo signal generating unit generates said tracking servo signal, by detecting a difference in ~~the~~ a  
quantity of reflected light said reflected optical beam detected by said photoreceptor element from an inner peripheral side and an outer peripheral side of said optical disk.
8. (Original) The optical disk reproducing apparatus according to claim 1, wherein  
said photoreceptor element has a cross-shape, divided into two along the tangential direction and divided into two along the radial direction of said optical disk.

9. (Currently Amended) The optical disk reproducing apparatus according to claim 1, wherein

said photoreceptor element is divided into two along the tangential direction of said optical disk, one of the two-split photoreceptor ~~element~~ elements is further divided into two along the tangential direction of said optical disk, and the other of the two-split photoreceptor elements is further divided into two along the radial direction of said optical disk.

10. (Currently Amended) An optical disk having a track including a plurality of recessed and protruded portions formed thereon, from which information ~~is~~ may be reproduced by optical beam irradiation, ~~the~~ said recessed and protruded portions ~~existing-mixedly being~~ disposed along said track in mixed relation to one another such that a signal indicative of a deviation between said an optical beam irradiated onto said optical disk and said track is will be detected with a different polarity at ~~each-of-the~~ said recessed portions and at said protruded portions, respectively, wherein a ratio of mixture of said recessed portions and said protruded portions is set such that a tracking servo signal, obtained by time-averaging said detected signal in a time period shorter than a response time of a tracking servo when said optical beam tracks said track, ~~has~~ will have one of said different polarities.

11.(Currently Amended) The optical disk according to claim 10, wherein  
said ~~formed~~ recessed and protruded portions are pits.

12.(Currently Amended) The optical disk according to claim 10, wherein  
said ~~formed~~ recessed and protruded portions include a recording  
mark.

13.(Currently Amended) The optical disk according to claim 10, wherein  
said ~~formed~~ recessed and protruded portions include a groove  
and/or a land.

14.(Currently Amended) The optical disk according to claim 10, wherein  
said detected signal is a signal that will be detected based on a  
phase ~~difference~~ differences in the successive quantity quantities  
of ~~light~~ said optical beam reflected from said recessed and  
protruded portions of said optical ~~beam~~ disk.

15.(Currently Amended) The optical disk according to claim 10, wherein  
said detected signal is a signal that will be detected based on a  
difference in the quantity of ~~light~~ said optical beam reflected from  
said recessed and protruded portions of said optical ~~beam~~ disk  
between and inner peripheral side and an outer peripheral side of  
said optical disk.

16. (Currently Amended) A An optical disk reproducing apparatus for reproducing by optical beam irradiation information from an optical disk having information recorded on an optical disk by the formation of a track formed of having a plurality of recessed and protruded portions, by optical beam irradiation, said apparatus comprising:

- a photoreceptor element for detecting a quantity of reflected light of said optical beam reflected from said optical disk;
- a signal detecting unit for detecting a signal indicative of a deviation between said optical beam and said track, based on the said reflected quantity of reflected light said optical beam detected by said photoreceptor element, said optical disk having recessed and protruded portions of said track of said optical disk being disposed along said track existing mixedly in mixed relation with one another, from which such that said signal based on said reflected quantity of said optical beam from said recessed portions will be detected with a different polarity than said signal based on said reflected quantity of said optical beam from said protruded portions is detected with the polarity being different in each of the recessed and protruded portions;
- a servo signal generating unit for generating a tracking servo signal by time-averaging said detected signal in a time period shorter than a response time of a tracking servo when said optical beam tracks said track, and a ratio of mixture of recessed and protruded portions being is set such that said generated tracking servo signal has one of said different polarities; and
- a gain changing unit for changing a gain of in said the tracking servo signal, in accordance with a magnitude of said generated tracking servo signal.

17. (Currently Amended) The optical disk reproducing apparatus according to claim 16, wherein  
the said recessed and protruded portions ~~formed on said optical disk~~ of said track are pits.

18. (Currently Amended) The optical disk reproducing apparatus according to claim 16, wherein  
the recessed and protruded portions ~~formed on said optical disk~~ includes of said track include a recording mark.

19. (Currently Amended) The optical disk reproducing apparatus according to claim 16, wherein  
the recessed and protruded portions ~~formed on said optical disk~~ includes of said track include a groove and/or a land.

20. (Currently Amended) The optical disk reproducing apparatus according to claim 16, wherein  
said signal detecting unit detects said signal based on a phase difference in the quantity of ~~light~~ said optical beam reflected from said recessed portions and from said protruded portions of said track of said optical beam ~~disk~~.

21. (Currently Amended) The optical disk reproducing apparatus according to claim 16, wherein  
said signal detecting unit detects said signal based on a difference  
in quantity of ~~light~~ said optical beam reflected from said  
recessed portions and from said protruded portions of said  
track of said optical beam disk between an inner peripheral  
side and an outer peripheral side of said optical disk.

22. (Currently Amended) A method of tracking a track located on an optical disk  
with an optical beam, said having a track including a plurality of  
recessed and protruded portions formed in mixed relation to one  
another thereon, from which information is may be reproduced by  
using said optical beam irradiation, said method comprising the steps  
of:

detecting a quantity of said optical beam reflected ~~light of said~~  
~~optical beam~~ from said optical disk;

detecting a signal indicative of a deviation between said optical  
beam and said track, based on said detected reflected  
quantity of ~~reflected light~~ said optical beam, ~~wherein said~~  
~~optical disk includes recessed and protruded portions~~  
~~existing mixedly from which a portion of said detected~~  
~~signal is detected with the polarity being different in each of~~  
~~said recessed and protruded portions based on quantities of~~  
said optical beam reflected from said recessed portions of  
said track having a different polarity than said detected  
signal based on quantities of said optical beam reflected  
from said protruded portions;

generating a tracking servo signal by time-averaging said detected signal in a time period shorter than a response time of a tracking servo when said optical beam tracks said track, wherein such that a ratio of mixture of said portions of said detected signal based on reflected quantities of said optical beam from said recessed portions and said protruded portions of said track respectively during said time period is set such that said generated tracking servo signal has one of said different polarities; and  
changing a gain of the said tracking servo in accordance with a magnitude of said generated tracking servo signal.

23. (Currently Amended) The method according to claim 22, wherein the said recessed and protruded portions generated on of said track of said optical disk are pits.

24. (Currently Amended) The method according to claim 22, wherein the said recessed and protruded portions formed on of said track of said optical disk includes include a recording mark.

25. (Currently Amended) The method according to claim 22, wherein the said recessed and protruded portions formed on of said track of said optical disk includes include a groove and/or a land.

26. (Currently Amended) The method according to claim 22, wherein  
in said step of detecting said signal, said signal is detected based  
on a phase difference in the quantity of light said optical beam  
reflected from said recessed portions and the quantity of said  
optical beam reflected from said protruded portions of said track  
of said optical ~~beam~~ disk, respectively.

27. (Currently Amended) The method according to claim 22, wherein  
in said step of detecting said signal, said signal is detected based  
on a difference in the quantity of light said optical beam reflected  
from said recessed portions and said protruded portions of said  
track of said optical beam-disk between an inner peripheral side  
and an outer peripheral side of said optical disk.